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Appendix F - U.S. Fish and Wildlife Service Final Coordination Act Report Extract, Reclamation Response, Draft BO Reasonable and Prudent Measures, and Endangered Species Act List.





United States Department of the Interior

FISH AND WILDLIFE SERVICE

Snake River Basin Office, Columbia River Basin Ecoregion
1387 South Vinnell Way, Room 368
Boise, Idaho 83709

JAN 19 2000

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Memorandum

To: U.S. Bureau of Reclamation, Snake River Area Office, Boise, Idaho.
Attn: Mr. Steve Dunn

From: *[Signature]* Supervisor, Snake River Basin Office, Boise, Idaho *[Signature]*

Subject: Arrowrock Dam Outlet Works Rehabilitation Project, Final Fish and Wildlife Coordination Act Report. File # 1009.0405/OALS #01-0231

Enclosed with this memorandum is the U. S. Fish and Wildlife Service (Service) Final Fish and Wildlife Coordination Act Report (CAR) on the potential effects of implementing the outlet works rehabilitation project at the Bureau of Reclamation's (Reclamation) Arrowrock Dam. We used a combination of information from the Idaho Department of Fish and Game (IDFG) and data reported by Reclamation on resident fish and wildlife resources present at Arrowrock Dam and Reservoir to complete this CAR. Jim Esch of my staff, the author of the CAR, would be happy to discuss its content with you at your convenience and is also available to answer questions you may have about its recommendations. The IDFG has reviewed this report in its draft form and is in substantial agreement with the analysis and recommendations contained herein. Please contact Mr. Esch at 378-5099 if the need arises.

Attachment

cc: IDFG, HQ, Boise (Scott Grunder)
IDFG, HQ, Boise (Eric Leitzinger)
IDFG, Nampa, (Dale Allen)

UNITED STATE DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE COORDINATION ACT REPORT

On the

ARROWROCK DAM OUTLET WORKS REHABILITATION
PROJECT, IDAHO

January, 2001

Prepared for U. S. Bureau of Reclamation
Snake River Area Office

Prepared By:

James R- Esch, Fish and Wildlife Biologist

Robert Ruesink, Supervisor
Snake River Basin Office

The following is an extract.

MITIGATION AND ENHANCEMENT RECOMMENDATIONS

The mitigation policy (January 23, 1981) of the Service is first to avoid an impact to fish and wildlife and their habitats, second, to minimize the impact, third, to rectify the impact after the fact and, lastly, to compensate for the total loss by creation of new habitat as close to in-kind and in-place as possible. The Service policy also encourages that monitoring take place to determine whether mitigation actions have been effective in meeting the goals of the Service and the State fish and wildlife agency.

Recommended Measures

- I. Determine and implement methods to prevent acute project-caused and long-term entrainment of bull trout and other resident fish from Arrowrock Reservoir into Lucky Peak Reservoir. This should include analysis for shallow or surface water withdrawals at Arrowrock Dam over the long term, after the project is completed.
2. Devise methods to reduce or eliminate sediment transport downstream of Arrowrock Dam as a result of project construction. Selection of Alternative A, which includes a residual pool volume of about 1500 acre feet behind Arrowrock Dam is a logical choice for reducing sediment delivery to Lucky Peak Reservoir and the Boise River downstream.
3. Investigate methods, in consultation with the IDFG and the Service, to regulate flows and provide discharges in the Boise River downstream of Lucky Peak Dam that are neutral or beneficial to fish and wildlife and their habitats when accomplishing the drainage of Arrowrock Reservoir for the project. The Service understands that there are flood control space needs in Lucky Peak Reservoir but we would like to avoid rapid or extreme flow fluctuations in the Boise River if possible through coordinated planning of fall and winter operations. This would help to preserve waterfowl and fishery habitat in the Boise River. Perhaps a change in the pattern of water storage during the year before year three of the action alternative would reduce the likelihood of having to deal with uncontrolled spill at Arrowrock Dam.
4. If the pool of Arrowrock Reservoir is going to be completely evacuated or lowered to an elevation suitable for completing the ensign valve replacement, determine in consultation with the Service and IDFG measures to be implemented to return buff trout entrained at the dam to upstream areas so that their life history requirements are more likely to be satisfied. For example, it is likely that increased effort at capturing bull trout in Lucky Peak reservoir would yield higher catch rates of these fish for transport upstream the year after the valves are replaced.
5. As a subset of the above, determine, in consultation with IDFG and the Service, methods and design of fish capture techniques downstream of Arrowrock Dam that will enable bull trout in Lucky Peak Reservoir to be moved and allowed to migrate to stream areas upstream of Arrowrock Reservoir. Identify types of gear, effort, and hydraulic conditions in Lucky Peak reservoir that are most conducive to capture of large numbers of migratory bull trout of all sizes and age classes.
6. Consult with the IDFG and the Service on alternatives for refilling Arrowrock Reservoir that are least damaging to fish and wildlife resources. Generally, our recommendation is to refill Arrowrock reservoir as quickly as possible the year following construction to allow resident fishes to repopulate this habitat. We need to be sensitive to the water needs in Anderson Ranch and Lucky Peak reservoirs as part of this

analysis so that fish and wildlife habitat is not severely degraded as a result of refill actions at Arrowrock project.

7. Work with IDFG to determine adequate fish stocking levels in Lucky Peak and Anderson Ranch Reservoirs to provide fishing opportunities for anglers displaced from Arrowrock Reservoir during project construction. Immediate restocking in Arrowrock Reservoir following the project could also benefit resident and migratory bull trout by providing an immediate forage base. Stocking rates and duration should be determined by the Service and IDFG. The IDFG has already suggested a strategy for stocking in Arrowrock Reservoir the spring following completion of the project with rainbow trout and kokanee in a manner and at levels that will likely produce good fishing conditions in the future. The details of this strategy are in IDFG's letter to Reclamation dated January 3, 2001.

8. Continue to consult with IDFG and the Service on the construction and operation of fish weirs and traps on the Middle Fork Boise River upstream of Arrowrock Dam. Fish traps provide vital management information on buff trout population status and migration patterns. If water conditions in Arrowrock Reservoir become degraded and acutely lethal to buff trout during the third year of project construction, a trapping facility upstream could be used to catch and transport fish that would otherwise be subjected to poor conditions in the reduced pool. Our recommendation is that Reclamation closely monitor conditions in Arrowrock Reservoir during the drawdown period so that immediate actions can be taken to use the fish weirs upstream to catch bull trout before they migrate downstream. This monitoring action and trap operation would be most vital during the fall and winter months when bull trout normally make their post-spawning downstream migration in the Boise River system.

9. Work -with the Service, the Forest, and IDFG to identify, design and implement off site fish habitat improvement projects that will either increase bull trout habitat directly or remedy fish passage problems that exist at road crossings, culverts, or other human caused obstructions. The Service supports IDFG's proposal that Reclamation establish a Boise Basin native fish habitat restoration fund as partial compensation for ongoing losses to buff trout and other native resident fishes as a result of the operation of its Boise River projects.

10. Continue to work with the Service and IDFG to establish a long-term minimum conservation pool level at Arrowrock Reservoir for preservation of aquatic resources including bull trout.

11. Investigate the need for and possible designs of a permanent fish capture facility at the base of Arrowrock Dam that would enable fish managers to return upstream migrant bull trout to the Boise River upstream of the project. This facility may be needed if entrainment of bull trout continues after the completion of the valve replacement project.

12. Cooperate with the Forest, the Service, and IDFG on the completion of bald eagle nest management plans for the two nests now documented as active on and adjacent to Arrowrock Reservoir.

13. Consult and coordinate with the Service and IDFG on the content and specifics of a fish and wildlife monitoring plan for the construction and post-construction time frame for the Arrowrock Dam valve replacement project. The monitoring plan elements that are described below are a starting point for further discussions on the activities that need to be undertaken to determine the effects of the project implementation on fish and wildlife and their habitats. Our concerns are less with water quality problems and more with the acute and chronic effects of the valve replacement project and the long term operation of Arrowrock Dam with the new clamshell gates installed.

14. Establish a working group ("Arrowrock Valve Replacement Working Group") comprised of biologists and hydrologists familiar with the project and the fish and wildlife resources of the Boise River Basin that will have oversight of the Monitoring Plan. This working group will be responsible for suggesting operating and physical modifications to the project on an ongoing basis during the actual construction phase of the valve replacement activity that are responsive to problems for fish and wildlife identified by the Monitoring Plan elements.

15. Prior to year three of construction under either of the action alternatives' conduct studies to estimate the bull trout population in Arrowrock Reservoir. Such studies should be coordinated with the IDFG and use sampling protocol identified by IDFG in their 1996 and 1998 work at Arrowrock Reservoir. Following completion of the valve rehabilitation project, a population estimate for buff trout in Arrowrock Reservoir should again be conducted. Data from the population studies should then be analyzed to determine whether the project had any significant impacts on the number of bull trout inhabiting Arrowrock Reservoir. These data, along with results from previous studies should be used for long-term trend analysis.

Construction Monitoring Plan

Potential problems associated with implementation of the valve replacement at Arrowrock Dam that might impact fish and wildlife resources include accidental spill of fuel or other caustic chemicals, noise from blasting or operation of construction-related equipment, stranding of fish during reservoir drawdown, and lack of adequate water quality due to high turbidity in the residual pools of Arrowrock and Lucky Peak. Flooding, drought forest fires, seismic activity, disruptive human activity, or other unforeseen natural or anthropogenic events could also result in impacts to fish and wildlife resources that might be exacerbated as a result of implementing the Arrowrock Valve Replacement Project. A recommended monitoring plan developed by Reclamation (USBR, 2000) is intended to provide for detection and resolution, to the extent possible, of any problems that may develop as a result of these circumstances. As such, it is an important part of the overall mitigation planning for this project and provides another level of protection for fish and wildlife resources that use Arrowrock Reservoir and its surrounding habitats for part or all of their life history requirements.

Biological Monitoring and Field Work.

Unforeseen environmental (e.g. high discharge events, drought; seismic events) or biological circumstances that might be influenced by construction activities could result in potential impacts to fish or other wildlife resources. Biological monitoring of fish and wildlife resources would be conducted to detect and address such circumstances where possible. The Arrowrock Valve Replacement Project Working Group (see # 14 above) would serve as the central coordinating body for monitoring project activities and recommending to Reclamation appropriate corrective actions that should be taken during and after construction to protect fish and wildlife resources. Reclamation would consider the Working Group's recommendations, and would formulate decisions regarding corrective actions to be taken in consultation with the Service.

Wildlife Resources. Bald eagle wintering and nesting success and productivity at Arrowrock Dam and downstream should be monitored. Nest management plans should be developed for the two active nests on Arrowrock Reservoir. The plans should account for all essential life history needs, including nest and roosting habitat, foraging, and protection from disturbance. No additional monitoring activities or mitigation measures are recommended by the Service for other wildlife species at Arrowrock Dam and Reservoir at this time.

Fishery Resources. Reclamation should work with the Service and IDFG to monitor drawdown of Arrowrock Reservoir and to monitor the residual pool in Arrowrock Reservoir and the area below Arrowrock Dam in Lucky Peak Lake for potential acute impacts of construction activities on bull trout.

Radio telemetry studies should be conducted on bull trout to provide an opportunity for monitoring the response of bull trout to project activities and to provide insights into ways to reduce the vulnerability of bull trout to potential effects of the project. Bull trout would be captured from both Arrowrock and Lucky Peak during the spring following the second year of construction activities. Radio tagged bull trout would then be released back into Arrowrock and Lucky Peak and their movements monitored throughout the remainder of the project. The methodology would follow that of Flatter (IDFG 1998). Detailed - annual study plans for this work should be developed cooperatively with IDFG and reviewed by representatives of the Working Group. Annual plans would be submitted by Reclamation to the Service for approval.

During years two and three of the construction period, Reclamation should periodically (e.g. biweekly) survey conditions in the residual pool of Arrowrock Reservoir and Lucky Peak Lake. Results would be reported in monitoring, progress, and final project reports to the Service and Working Group. If unusual mortality to bull trout or other fish species is observed during periodic monitoring surveys, the Service and IDFG should be advised by Reclamation; an attempt to determine causative factors should be initiated; and the results of the investigation should be documented. If those factors are associated with the Arrowrock Valve Replacement Project or related environmental conditions, Reclamation should implement BMPs and take whatever immediate corrective action (e.g. trap and haul) is deemed necessary and appropriate to resolve the situation. Reclamation should consult with and advise the Service throughout the process, any corrective action should be developed in coordination with the Service and other members of the Working Group.

Under direction and guidance from IDFG, experimental (varied mesh size) gill nets should be used to capture bull trout in Lucky Peak Reservoir from April through June. Captured fish would be transferred to live wells and transported to Arrowrock for release. Trap and haul operations of bull trout from Lucky Peak to Arrowrock began in 2000 as a result of the Service's 1999 Biological Opinion on Reclamation's Operation and Maintenance Activities in the Snake River Basin (USFWS 1999). They continue indefinitely or until a permanent solution is found to the bull trout entrainment problem.

Reclamation, IDFG, and the Service should closely track results from biological and water quality monitoring during implementation of the valve replacement project. Based on those results, the agencies should determine appropriate mitigation actions. Potential actions to protect bull trout include trapping upstream of Arrowrock Reservoir in the Middle Fork Boise River in an effort to reduce the number of fish returning to the residual pool during year 3 of construction. If water quality and biological monitoring during the third year of construction indicate that bull trout occupying the residual pool were at high risk, Reclamation would implement recommendations approved by the Service for trap and haul of bull trout from the Middle Fork Boise River (upstream from Arrowrock Reservoir). These measures would be initiated to minimize impacts to bull trout occurring in or upstream of Arrowrock Dam that may result from implementation of the proposed construction project.

Protection of bull trout during the proposed action is an important short-term objective. Experimental trapping would begin September 2002 one year before initial reservoir drawdown. These studies would be performed to ensure that weir and trap operations are effective and to provide information needed for siting and design of fish trapping facilities.

Reclamation has worked with IDFG in developing a protocol for trapping and handling bull trout on the North Fork Boise River. This protocol would be modified for use on the Middle Fork Boise river upstream from Arrowrock Reservoir. A steel picket style weir with upstream and downstream traps will be operated across the entire length of the river cross section near the Willow Creek Campground from September through November. Downstream migrating juveniles and returning adult spawners would be captured if conditions in Arrowrock are unsuitable for bull trout. There would be no trapping of fish if suitable water quality is present in Arrowrock and/or fish mortalities are not observed. Under Alternative B, transport would occur only when conditions for bull trout in Arrowrock Reservoir become unfavorable. Holding of bull trout at the trap may occur depending on the number of bull trout present, and the time remaining to complete construction.

Recreational Fishery at Arrowrock Reservoir

Reclamation should also coordinate closely with the IDFG to augment the stocking of fish following completion of construction activities. As a result of the drawdown of Arrowrock Reservoir and subsequent limited food base (fish) for bull trout, stocking may provide a suitable food source until typical bull trout prey species have repopulated the reservoir. In this regard, the IDFG has provided Reclamation and the Service with correspondence that details their recommendations on mitigating and enhancing the fishery and recreational resources at Arrowrock Reservoir specifically and in the Boise River Basin in general. Their letter, dated January 3, 2001 proposes the following (IDFG, 2001), which the Service supports:

- I. Restock Arrowrock Reservoir in the spring following year 3 of the project with rainbow trout fingerlings, catchables, and kokanee fingerlings at a cost of \$132,625.00.
2. Make a payment of \$60,000.00 to IDFG as restitution for lost angling activity on Arrowrock Reservoir as a result of the project. This is a one time payment request. The Service would prefer to have any money payment linked to habitat or recreational facility improvements on site at Arrowrock Reservoir or as near to the site of the impact as possible. However, if restitution funds by law are deposited in the State Treasury, we will have little ability to recommend how those monies are spent.
3. Establish a Mitigation Fund for stream habitat projects in the Boise River Basin with oversight from the Southwest Basin Native Fish Advisory Group. Again, this proposal is for a one time payment to the IDFG.
4. Intensively pursue trapping and recapture of bull trout that are entrained through Arrowrock Dam and return them to the Reservoir upstream. This proposal includes biological monitoring activities, Boise River fish weir operation, angler education needs, and a population estimate of bull trout in Arrowrock Reservoir 2 years after the project is completed.
5. The IDFG supports alternative water management strategies and the establishment of a fall and winter minimum pool in Arrowrock Reservoir that provides better year round habitat for resident fish and reduces the likelihood of fish being entrained through Arrowrock Dam. This proposal is in agreement with the Service's 1999 Biological Opinion on Reclamation Operation and Maintenance Activities in the Snake River Basin (USFWS 1999).

Summary and Conclusion

Overall, the Service is satisfied with the level of coordination and cooperation that has occurred between our office and Reclamation during the development of this project and the environmental analysis of its effects. The IDFG has also been closely involved with us on this project and we appreciate their support, comment, and analysis of this complex undertaking. The Service remains concerned that the long term effects of this activity are very difficult to predict and we remain convinced that only through a sustained high level of involvement by the Service, Reclamation, and the IDFG will the fish and wildlife resources of the Boise River Basin be restored after this project is completed. The monitoring and future study needs that we have identified should go a long way in providing the means for obtaining the data needed to protect and enhance buff trout populations in the future. Key issues that remain to be resolved concerning bull trout at Reclamation's reservoirs in the Boise River Basin include chronic entrainment and the need for minimum reservoir pools to sustain bull trout that are now accustomed to reside there during the winter months each year. We also look forward to a closer working relationship between the Service, IDFG, and Reclamation on future operations that may affect fish and wildlife resources at Arrowrock, Lucky Peak, and Anderson Ranch Reservoirs.

The Service and IDFG are anxious and willing to discuss any and all of these proposals to mitigate for the effects of the Arrowrock Dam Valve Replacement Project on fish and wildlife resources. Please contact Jim Esch of this office for his assistance in this regard.

Reclamation Responses to USFWS Recommended Measures Contained in the Final Fish and Wildlife Coordination Act Report

1. Acute and Long-term Entrainment Solutions - Significant acute entrainment of resident game and nongame fish and some bull trout remaining in the year 3 Arrowrock residual pool is unavoidable. Reclamation proposes to trap returning migratory adult and juvenile bull trout above the reservoir and haul them to Lucky Peak Lake. After completion of the project these fish would be captured and returned to Arrowrock Reservoir. Over the long term, Reclamation would continue to move entrained bull trout from Lucky Peak Lake to Arrowrock Reservoir until entrainment no longer occurs. We believe that reducing spillway operation and the deeper reservoir releases from the new clamshell gates will significantly reduce entrainment. We are committed to monitoring entrainment during and after the project and will reconsult with USFWS if additional long-term solutions are needed.
2. Devise Methods to Reduce Sediment Transport Downstream of Arrowrock - We agree. Alternative A, the Preferred Alternative, provides the lowest probability of significant sediment releases. We have further reduced the probability (to 15%) of large sediment releases through our decision to only use the sluice gates if the work area is flooded for more than five cumulative days.
3. Coordinate Flows and Discharges - We will adjust ramping rates to avoid impacts to the extent we can and will coordinate with IDFG and USFWS on operations as part of the Arrowrock Valve Replacement Working Group (AVRWG) discussed below.
4. Determine Measures to Return Bull Trout to Arrowrock - We agree that an intensive recapture effort is needed immediately after construction and agree to do so. We will work within the AVRWG to determine methods and level of effort. See Appendix I of the FEIS for details on proposed recapture efforts.
5. Work With USFWS and IDFG to Determine Specific Capture Techniques - We agree to do so. See Bull Trout Mitigation Work Plan in Appendix I of the FEIS.
6. Consult With USFWS and IDFG on Refill of Arrowrock - We agree, and propose to fill Arrowrock immediately after construction to the extent that reservoir system operations allow.
7. Restocking of Arrowrock and Other Reservoirs - We have agreed to assist IDFG in re-stocking Arrowrock following construction. See fish mitigation section of FEIS and responses to comment letter 1A in Appendix K. It is our understanding that IDFG may make adjustments to stocking other reservoirs to meet demands of displaced anglers.
8. Consult With USFWS and IDFG on Fish Weirs - A weir trap is proposed on the Middle Fork Boise River for capture and relocation of bull trout. We are proposing to operate the North Fork weir as part of the juvenile bull trout study through 2002. We will continue to consult with USFWS, and IDFG on operation of these weirs. See Bull Trout Mitigation Work Plan in Appendix I of the FEIS.

9. Work With USFWS, IDFG, and USFS on Off Site Habitat Improvement Projects - While we may be able to offer some technical and in-kind assistance we believe that projects in the watershed above Reclamation facilities are primarily the responsibility of the land management agencies, and we do not plan to establish a special fund for this work. See responses to IDFG comment letter 1A in Appendix K of the FEIS.

10. Continue to Work With USFWS and IDFG to Establish an Arrowrock Conservation Pool - We agree and are continuing to collect the data needed to determine the necessary conservation pool.

11. Investigate Permanent Fish Capture Facility Below Arrowrock Dam - We agree that such a facility may be appropriate if radiotelemetry monitoring of bull trout indicates entrainment is still occurring after completion of the outlet works project, and there are no other feasible means of preventing entrainment. We will continue to consult with USFWS and IDFG in this regard.

12. Complete Bald Eagle Nest Site Management Plans - We agree to work with all agencies in developing these plans.

13. Develop a Fish and Wildlife Monitoring Plan During and After Construction - We agree that such a plan is necessary and should be formulated by the AVRWG. Some elements of the monitoring plan have been formulated and are included in Appendix C and Appendix I of the FEIS. See also the responses below.

14. Establish an "Arrowrock Valve Replacement Working Group" - We will take the lead in establishing the AVRWG to include representatives from USFWS, IDFG, USFS and other appropriate agencies. This group will be formed during summer 2001.

15. Conduct Pre- and Post-Project Bull Trout Population Studies - These studies are proposed. See the Bull Trout Mitigation Work Plan in Appendix I of the FEIS.

Construction Monitoring Plan - We agree to develop such a plan in conjunction with the AVRWG. See response 13 above.

Biological Monitoring and Field Work

Wildlife Resources - We have agreed to cooperate with USFS to develop nest site management plans for the two bald eagle nests at Arrowrock Reservoir. We do not believe wintering bald eagles would be adversely affected by the project in any measurable way and winter monitoring would provide very little useful information. USFWS has concurred with Reclamations determination that the project may affect but is not likely to adversely affect wintering bald eagles. We therefore do not propose to conduct monitoring of wintering bald eagles.

Fishery Resources - We have agreed to conduct water quality and radiotelemetry monitoring and evaluate bull trout capture techniques. We will coordinate with the AVRWG to develop detailed monitoring procedures and evaluate results. See also Appendix I of the FEIS.

Recreational Fishery at Arrowrock Reservoir

1. We agree to compensate IDFG for this amount towards restocking expenses the spring and summer following completion of the project.
2. We do not believe we are responsible for monetary compensation to IDFG for any lost angling opportunity that may occur, just as we are not responsible to directly compensate other recreation providers. We believe the IDFG estimates for recreation losses at Arrowrock Reservoir are high, especially considering the very low use that occurs in winter. We also believe that many would-be anglers would tend to use Lucky Peak as a substitute during construction year 3 under the Preferred Alternative, and that actual “lost” days would be very low. We will make a concerted effort in coordination with IDFG to keep the fishing public well-informed as to other fishing opportunities that exist at Lucky Peak and other nearby water bodies.
3. We do not believe it is our responsibility to fund habitat improvement projects in the upper watershed with no connection to Reclamation’s facilities and operations. We will continue to cooperate with IDFG and USFWS, and USFS on research projects and may be able to provide some financial and in-kind assistance on a case-by-case basis for habitat projects, but we do not believe providing a “habitat fund” for use in the upper basin is our responsibility.
4. We agree to intensively trap and transport bull trout from Lucky Peak to Arrowrock after the project. See response to 4, 5, and 8 above and Appendix I of the FEIS.
5. We agree to implement the measures and terms and conditions in the 1999 BO and applicable measures towards a minimum pool in the BO for this project. We will look to USFWS and IDFG for assistance in determining what the eventual minimum pool would be and any operational changes that may be required.

Summary of Reasonable and Prudent Measures and Terms and Conditions U.S. Fish and Wildlife Service Draft Biological Opinion January 2001

Bull Trout

AMOUNT OR EXTENT OF TAKE

The Service anticipates incidental take of bull trout will be difficult to detect for the following reasons: bull trout are wide ranging; finding dead or impaired specimens is unlikely, especially during egg and larval life history stages; losses may be masked by seasonal fluctuations in numbers, take due to entrainment at Arrowrock Dam will usually be associated with high flow conditions and turbidity of the water due to reservoir drawdown will make it difficult to find injured or dead fish. However, the following level of take of this species can be anticipated by partial, or at worst, total loss of bull trout food and forage base, cover, water quality or quantity as Arrowrock Reservoir is drained in the third year of this project. This is because Arrowrock Reservoir bull trout will be either injured, killed or entrained at a high rate when the water content is lowered to facilitate the valve replacement work during year three of the project. If the project coincides with a high runoff in the Boise River basin, and the sluice gates at Arrowrock Dam are needed to evacuate the reservoir content, the Service anticipates that all bull trout and other fish in the reservoir will be lost downstream. Based on the best information available, we estimate that in an average flow year when runoff can be controlled and passed through the existing outlet works without using the sluice gates, 25 percent of all bull trout in Arrowrock Reservoir, or 125 fish, will be lost as take incidental to the project. If high runoff occurs as described above and the sluice gates are opened, the entire reservoir content will be evacuated and we anticipate that up to 100 percent of the bull trout present, or 500 fish, will be taken. These are adult bull trout and are based on recent population estimates of bull trout in Arrowrock Reservoir done by IDFG that determined that approximately 500 bull trout over 300 mm reside there in an average winter. The Service does not have information on the numbers of juvenile bull trout present, however we believe that this number is low due to their habit of not migrating downstream to Arrowrock Reservoir until they have reached adult size.

EFFECT OF TAKE

In the accompanying biological opinion, the service determined that this level of anticipated take is not likely to result in jeopardy to bull trout.

REASONABLE AND PRUDENT MEASURES

Reasonable and Prudent Measure #1.

Reduce incidence of bull trout entrainment due to reservoir operations.

Terms and Conditions for #1.

1. Initiate studies necessary to develop long-term entrainment-reduction solution.
2. Progressively implement interim measures to reduce entrainment from Project operations.
3. Reinitiate consultation with the Service based on findings of the above investigations to implement long-term solutions to the bull trout entrainment problem at Arrowrock Dam. Initiate long-term efforts to eliminate entrainment at Reclamation dams in 2001 to be completed by 2004.

Reasonable and Prudent Measure #2.

Within existing authorities and voluntary partnership opportunities, work towards ensuring reservoir operations do not result in de-watering of Arrowrock Reservoir to the extent that adfluvial bull trout resident there during part of their life history are stressed or killed.

Terms and Conditions for #2.

1. Initiate water quality monitoring/modeling efforts to determine water quality parameters and conservation pool necessary to support adfluvial bull trout in Anderson Ranch and Arrowrock reservoirs. Complete these investigations by December, 2004.
2. Initiate an investigation of alternatives for creating a conservation fisheries pool in Arrowrock Reservoir that now support resident/adfluvial bull trout. Include water users, the Service, Tribes, and State agencies in these discussions. Complete by December, 2004.
3. Begin implementing, within existing authorities and voluntary partnership opportunities, a method to ensure that a conservation pool is available in Arrowrock Reservoir under high, low and average water year scenarios, by December, 2004.

Reasonable and Prudent Measure #3.

Investigate methods to provide safe fish passage around Arrowrock Dam for bull trout adults and juveniles.

Terms and Conditions for #3.

1. Initiate research necessary to evaluate feasibility of providing passage at Arrowrock Dam.
2. Reinitiate consultation based on findings to implement a long-term bull trout passage solution at Arrowrock Dam.

Reasonable and Prudent Measure #4

Initiate a capture and transport program to move bull trout entrained at Arrowrock Dam back upstream so they can complete their spawning and foraging migrations in tributaries above Arrowrock Reservoir.

Term and Condition for #4

Complete discussions with the Service and IDFG on a plan to be implemented immediately to begin capturing bull trout that are entrained at Arrowrock Dam. The plan will need to be in place and operating from 2001 and will continue to be implemented in the future as long as bull trout entrainment occurs at Arrowrock Dam.

Reasonable and Prudent Measure #5

Complete planning of and obtain the concurrence of the Service, Idaho State Agencies and the EPA on a water quality monitoring plan for the construction period for this project.

Term and Condition for #5

A plan, such as detailed in the BA for this project, needs to be agreed to and implemented from the onset of construction through the year following its completion to insure that adverse water quality conditions are detected in a timely manner. Therefore, complete the review process for the water quality monitoring plan by September of the first year of the construction period for the outlet works project.

Reasonable and Prudent Measure #6

Reclamation should take the lead in forming a Fish Advisory Group for the purpose of being responsive to emergencies and for analyzing data collected during the monitoring activities planned for the construction phase of this project.

Term and Condition for #6

A Fish Advisory Group that can convene quickly and/or on a regular basis is the best way to avoid major losses to bull trout or other fish and wildlife during the construction phase of the Arrowrock project. Reclamation should have this group in place by September of the first year of the construction period for the outlet works project and should keep in functioning until all of the post construction monitoring associated with the project is completed.

Reasonable and Prudent Measure #7

Prior to year three of the construction period for the project and again in the year following construction, conduct population estimates for bull trout in Arrowrock Reservoir.

Term and Condition for #7

These population estimates are needed to establish effects of the project on the population, what the carrying capacity of Arrowrock Reservoir is and to establish a benchmark reference for future disturbances that may occur in the Boise River basin.

Reasonable and Prudent Measure #8

Continue radiotelemetry studies of bull trout in Arrowrock and Lucky Peak Reservoirs.

Term and Condition for #8

Radiotelemetry data will enable biologists in the Fish Advisory group to respond to problems such as migration delays, vulnerability to poaching and would continue to provide valuable information on entrainment rates of bull trout from Arrowrock Reservoir to Lucy Peak Reservoir. A final plan to monitor this radiotelemetry data needs to be approved by the Service by September of the first year of construction at the project.

Reasonable and Prudent Measure #9

Continue, as determined by the Fish Advisory Group, the operation of fish capture weirs on the Boise River Middle and North Forks.

Term and Condition for #9

If hostile conditions for aquatic life, including bull trout, occur in Arrowrock Reservoir during the construction phase of the project, an operating weir on the North Fork of the Boise River will enable fishery managers to have the option of transporting bull trout around Arrowrock Reservoir to Lucky Peak Reservoir. A final plan to utilize the weir on the North Fork must be approved by the Service by September of the first year of construction at the project.

Bald Eagle

AMOUNT OR EXTENT OF TAKE

The Service anticipates incidental take of bald eagles will be difficult to detect for the following reasons: bald eagles are wide ranging; finding dead or impaired specimens is unlikely, and they are vulnerable in the Boise River basin to disturbances from a number of human caused sources. However, the following level of take of this species can be anticipated by partial, or at worst, total loss of their food and forage base, cover, water quality or quantity as Arrowrock Reservoir is drained in the third year of this project. If the preferred alternative is implemented and eagles are unable to find adequate forage near their established territories, the Service anticipates that there could be the loss of one bald eagle nest on Arrowrock Reservoir as a result of the project.

EFFECT OF TAKE

In the accompanying biological opinion, the service determined that this level of anticipated take is not likely to result in jeopardy to bald eagles.

REASONABLE AND PRUDENT MEASURES

Reasonable and Prudent Measure #1

Reclamation will work with the Boise National Forest, which manages the land around Arrowrock Reservoir, to prepare nest site management plans for the two bald eagle nests at Arrowrock. The management plan will define home range and habitat use by the eagles and will recommend land and water management actions to protect bald eagle nesting territories.

Term and Condition for #1

A plan needs to be developed for the design, funding and execution of studies and analyses for the two bald eagle nesting territories on Arrowrock Reservoir that will enable the Boise National Forest to complete management plans for these birds. By 2002 Reclamation needs to complete a strategy with the Boise National Forest for drafting these plans. The plans need to be completed prior to the third year of project construction at Arrowrock Dam.

Reasonable and Prudent Measure #2

Determine in cooperation with the Service, Boise National Forest and IDFG the potential need and effectiveness of supplemental winter feeding of bald eagles at Arrowrock Reservoir.

Term and Condition for #2

Supplemental feeding has been used successfully at other reservoir construction projects such as at Island Park Dam when the bald eagles normal fish forage base was eliminated because of total reservoir evacuation. Prior to the third year of project construction, Reclamation should fully analyze the potential benefits to bald eagles of providing fish or deer carcasses during the winter and spring of the final construction to alleviate feeding problems for these birds if their normal food base is eliminated. This analysis should be done in consultation with the Service and a decision made on whether to provide supplemental feeding by May of the year prior to Arrowrock Reservoir drawdown (year three of construction).

Gray Wolf

Reclamation determined and the Service concurs that the project would have no effect on the gray wolf.

Ute Ladies' -Tresses

Reclamation determined and the Service concurs that the Project would have no affect on Ute-ladies-tresses.